Muddy Waters
A Discussion of Recent Turbidity measurements in the Delta

OCAP Workshop 2010

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10/10/2010

Outline

(1) What we did (installation of new sites)

(2) What we learned

a) Peaks in discharge and turbidity are not coincident during first flush

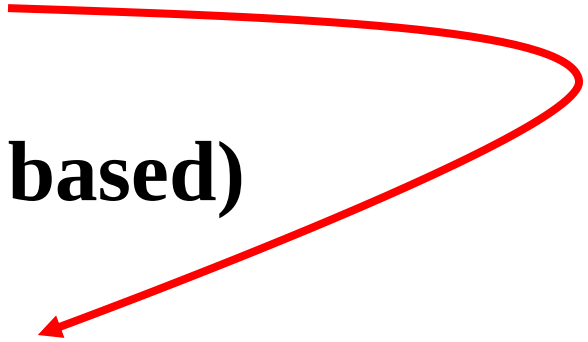
c) Flooded Islands act as settling basins

d) Turbidity field is complex

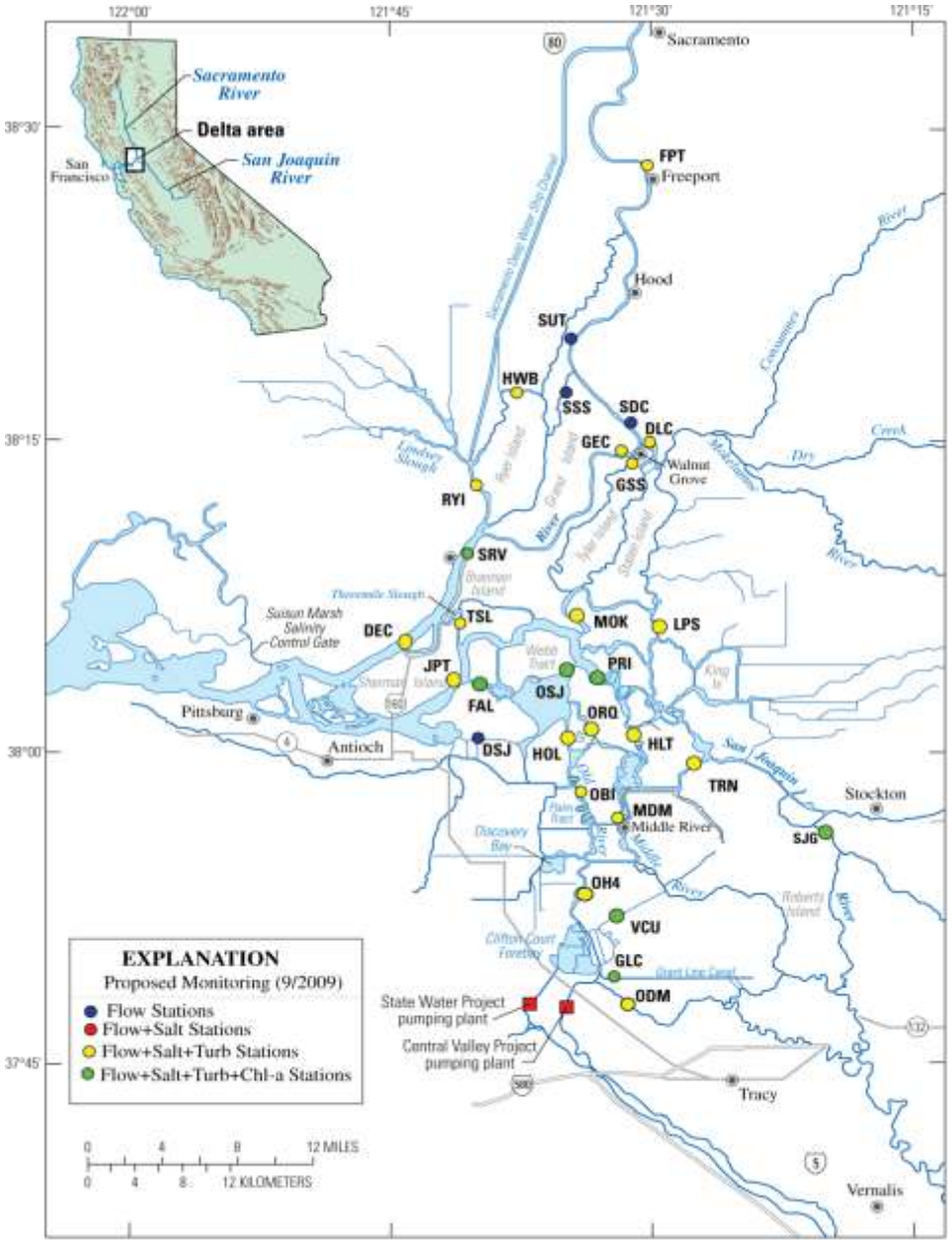
(3) Data Products (web based)

a) Time series package

b) Scalar field interpolations



What we did: Installed about 12 turbidity stations



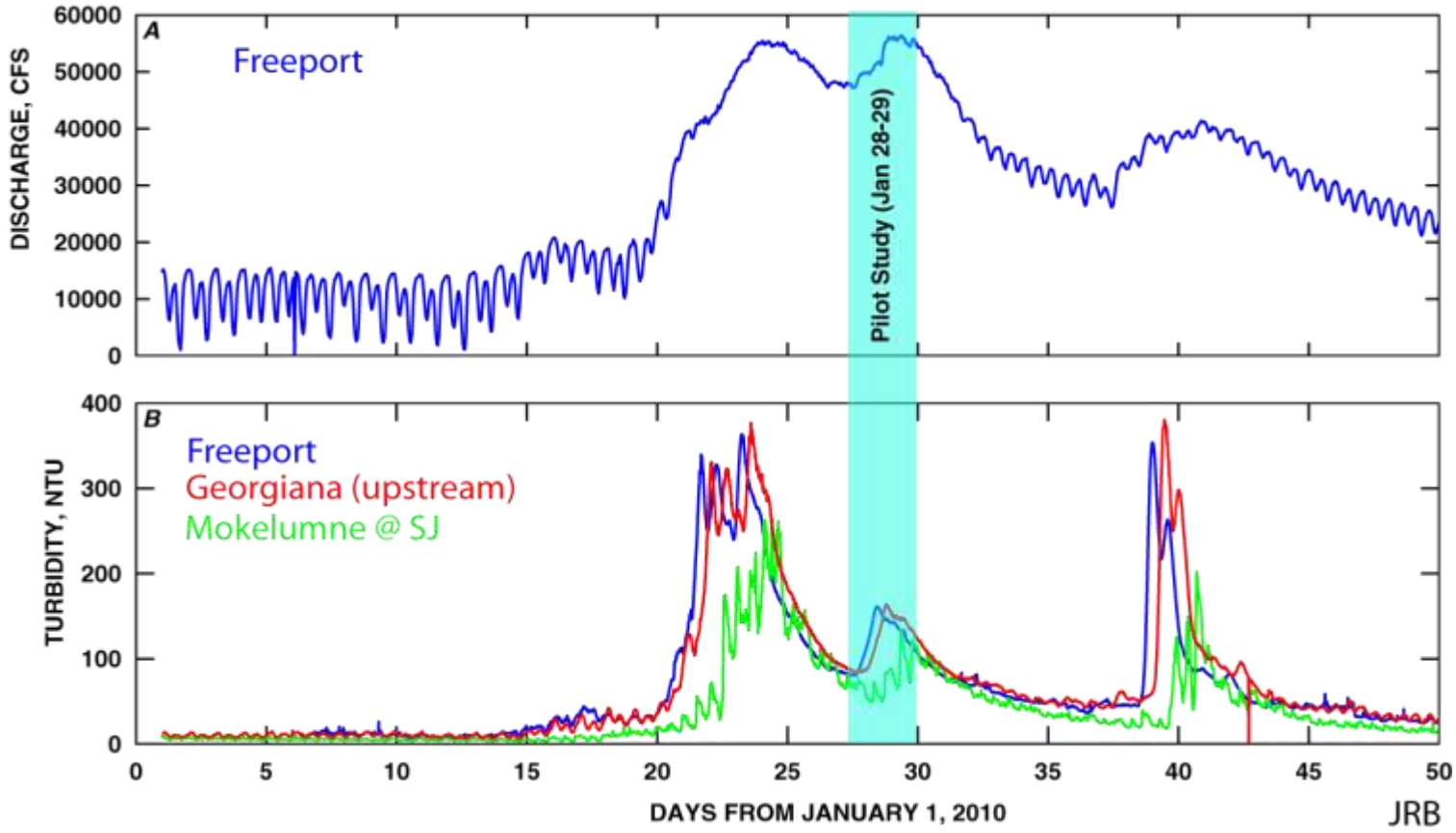
Location of PROPOSED (9/2009) sampling locations and the collected parameters in the Delta Area of California.

Field Team


Jim George
Jim DeRose
Jon Yokomizo
Curt Battenfeld
Brad Sullivan
Liz Beaulieu

Peaks in river discharge and turbidity are not coincident during first flush

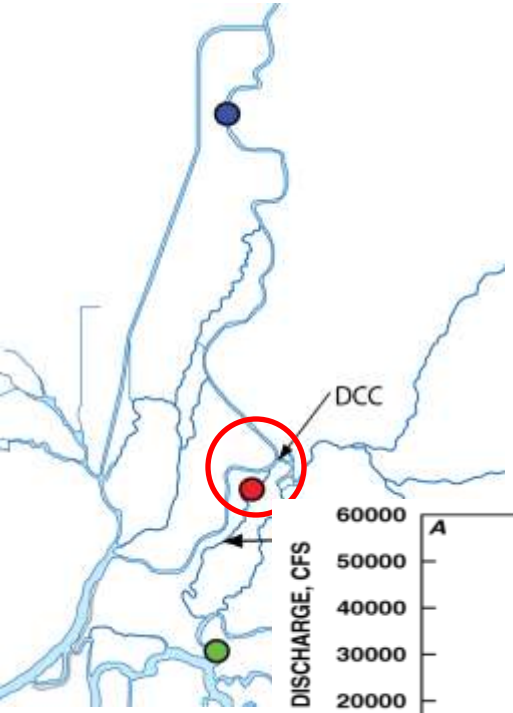
Time-Series Data – Flow and Turbidity
January-February, 2010

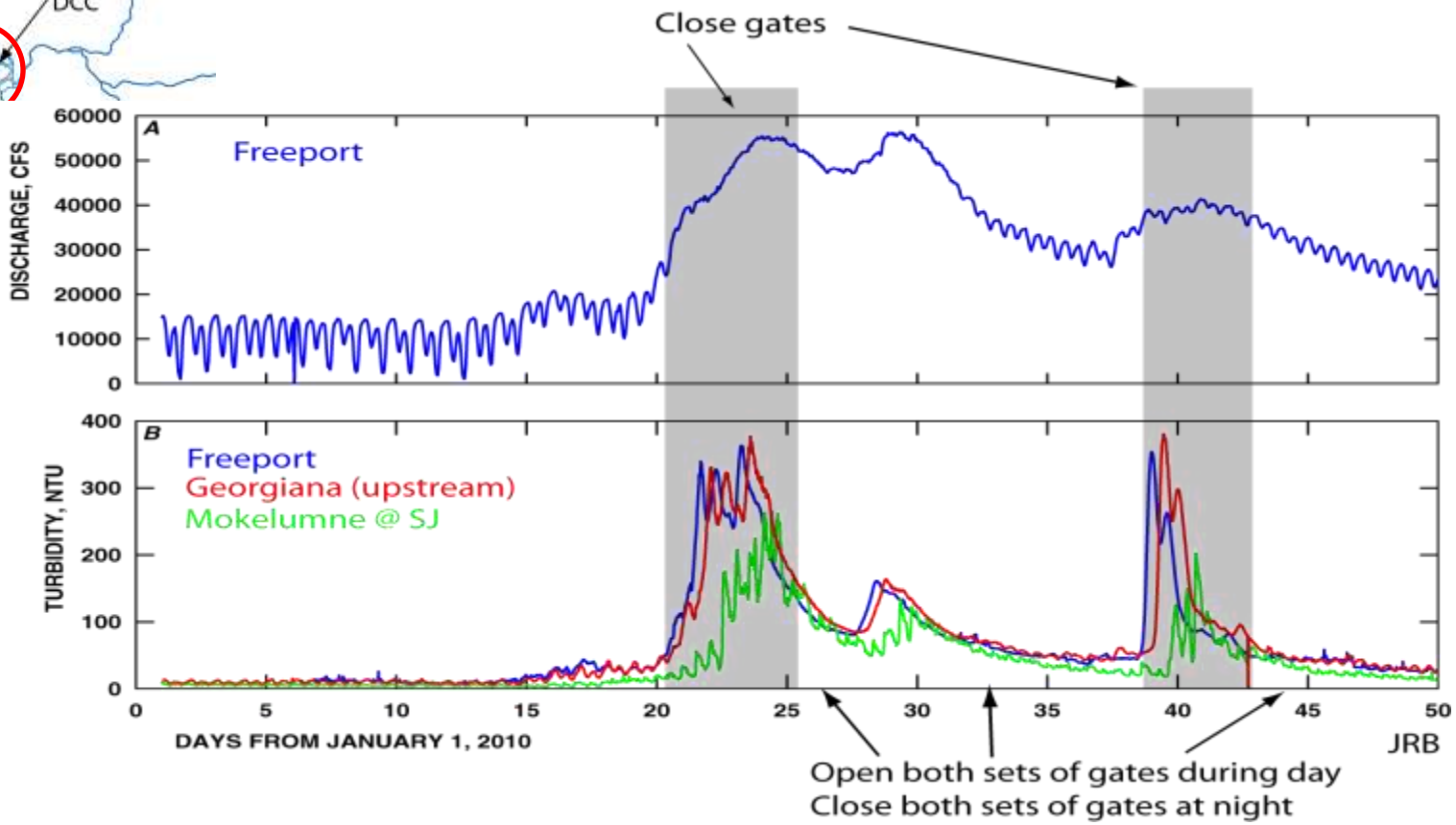


Management Implications?

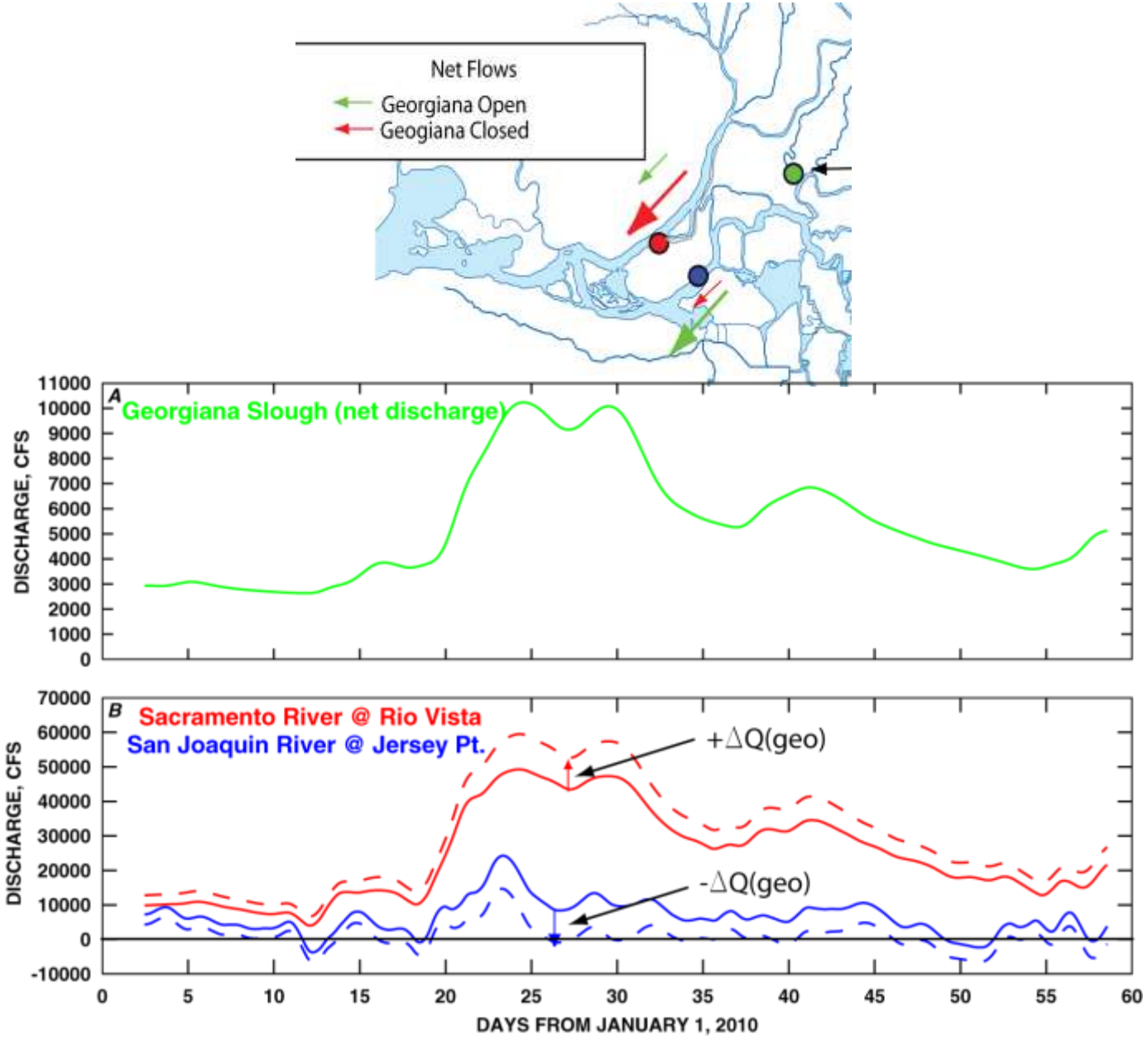
Control turbidities in central/south Delta through

Operable gates in Georgiana and in the DCC





Effect on Western Delta net Flows from Closing Georgiana Slough?



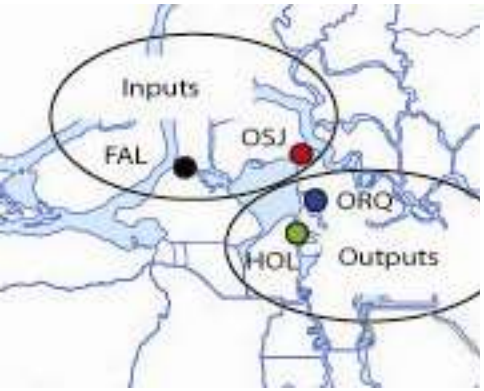
If DCC were open even bigger impact (at least double)

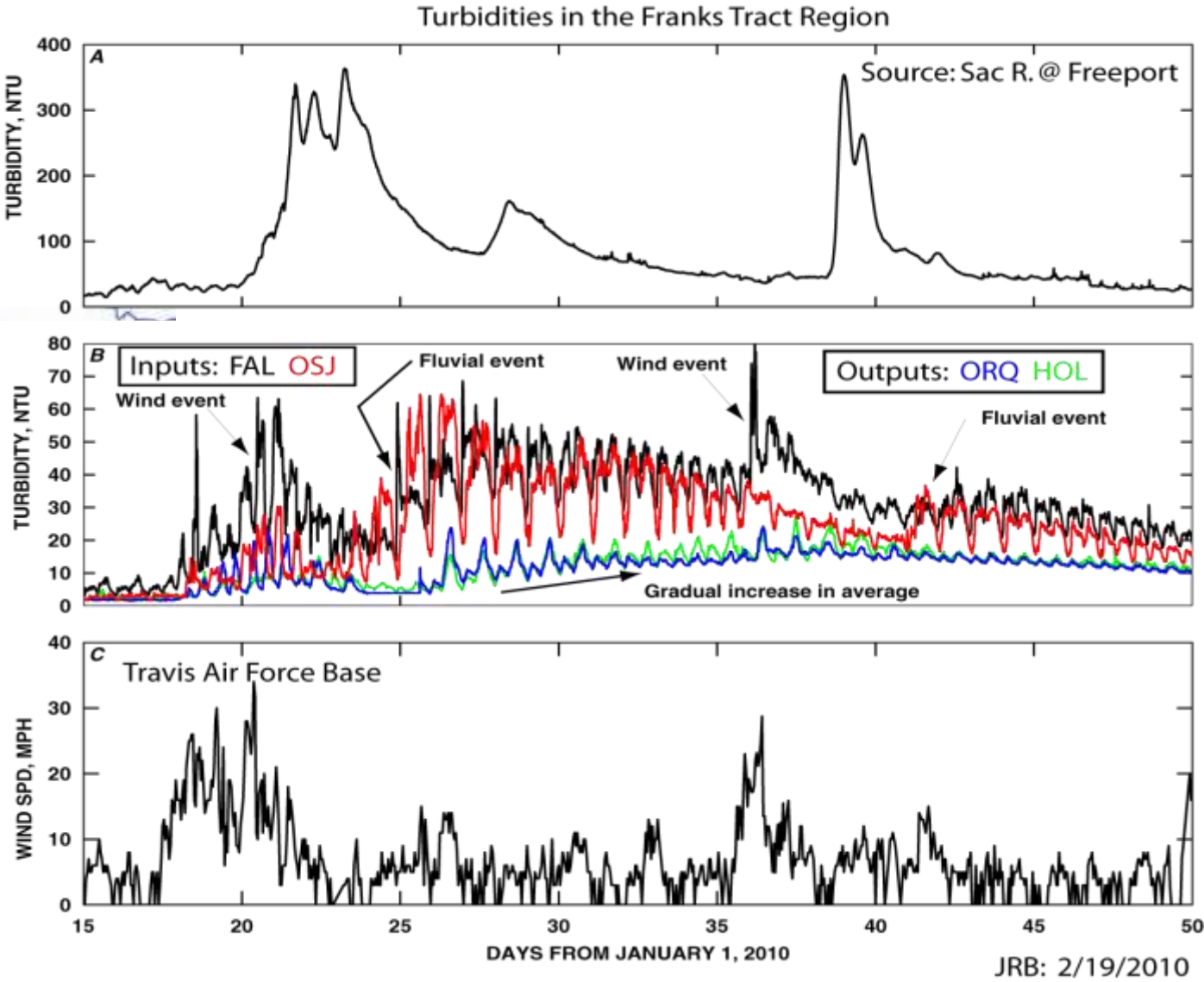
Challenges to operating gates in DCC and Georgiana to alter Turbidity fields and Western delta hydrodynamics

(1) Need to construct gate in Georgiana
(2) DCC gates are currently closed to protect salmon
(3) Need to alter DCC closure requirement
@ Sac flows that exceed 25k cfs

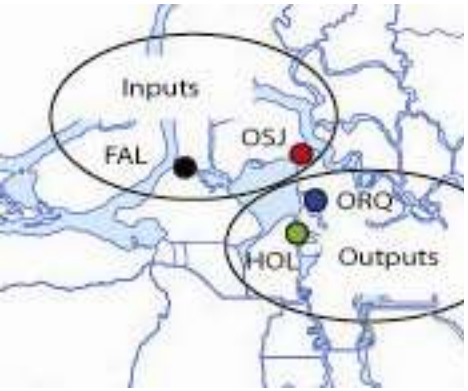
Flooded Islands act like settling basins

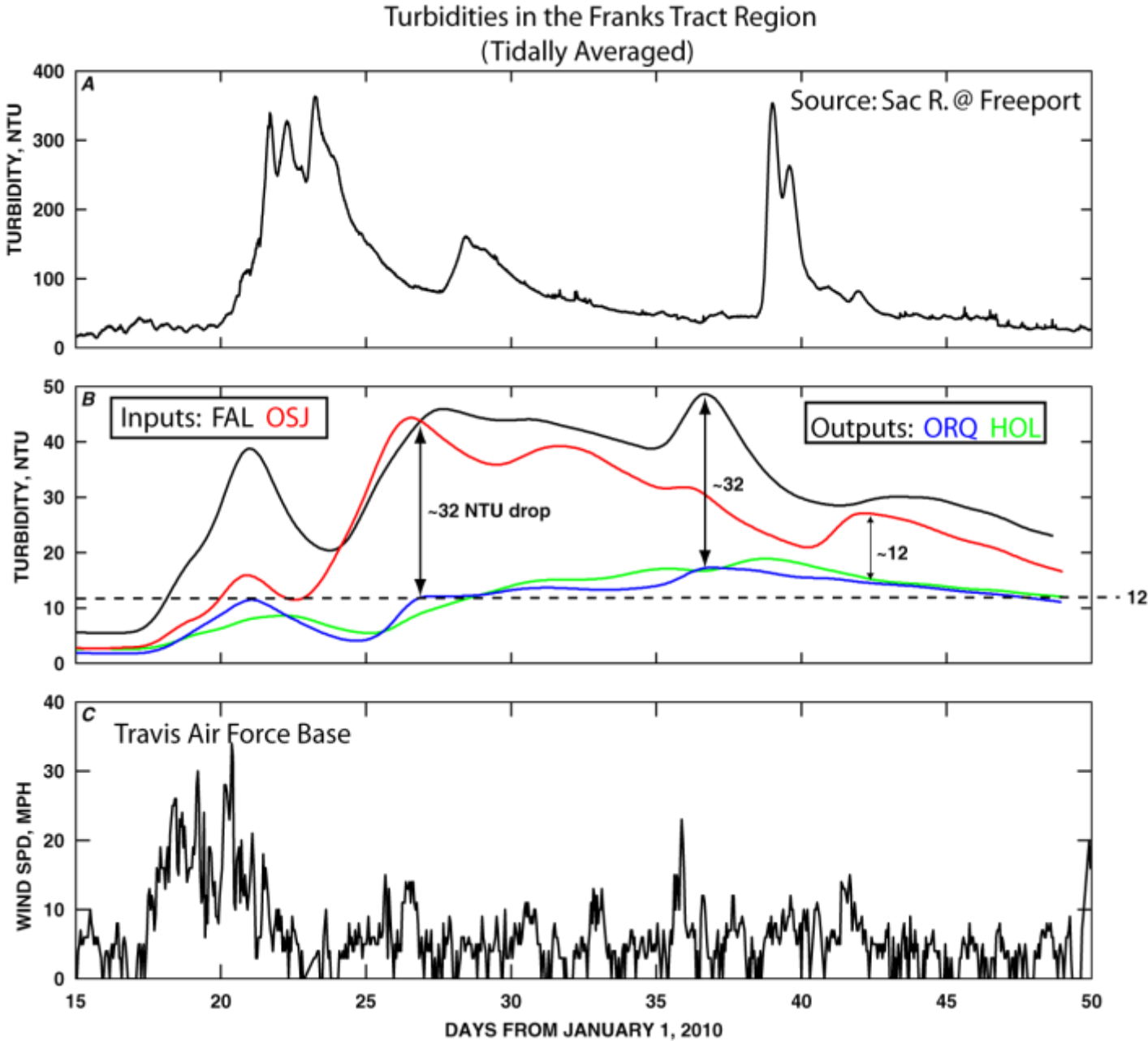
Turbidities drop dramatically across Franks Tract





Turbidities drop dramatically across Franks Tract





Franks Tract – Tracer Dye
Conservative – numerical model

Franks Tract – Jets
Enhance mixing with ambient water - settling

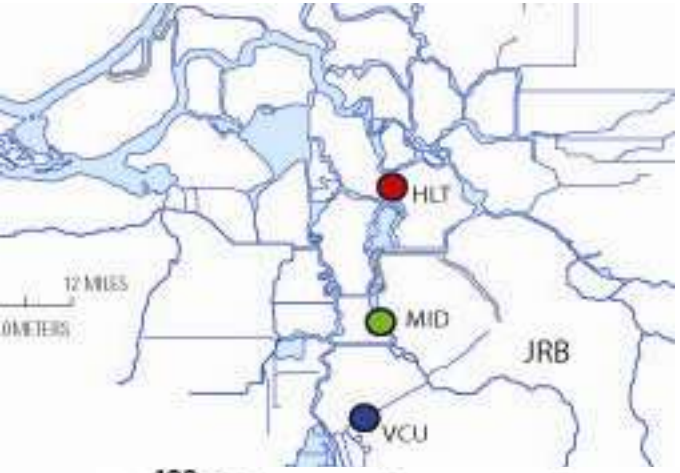
Compare drop in turbidity

(a) Across channel without flooded Island (Old River)

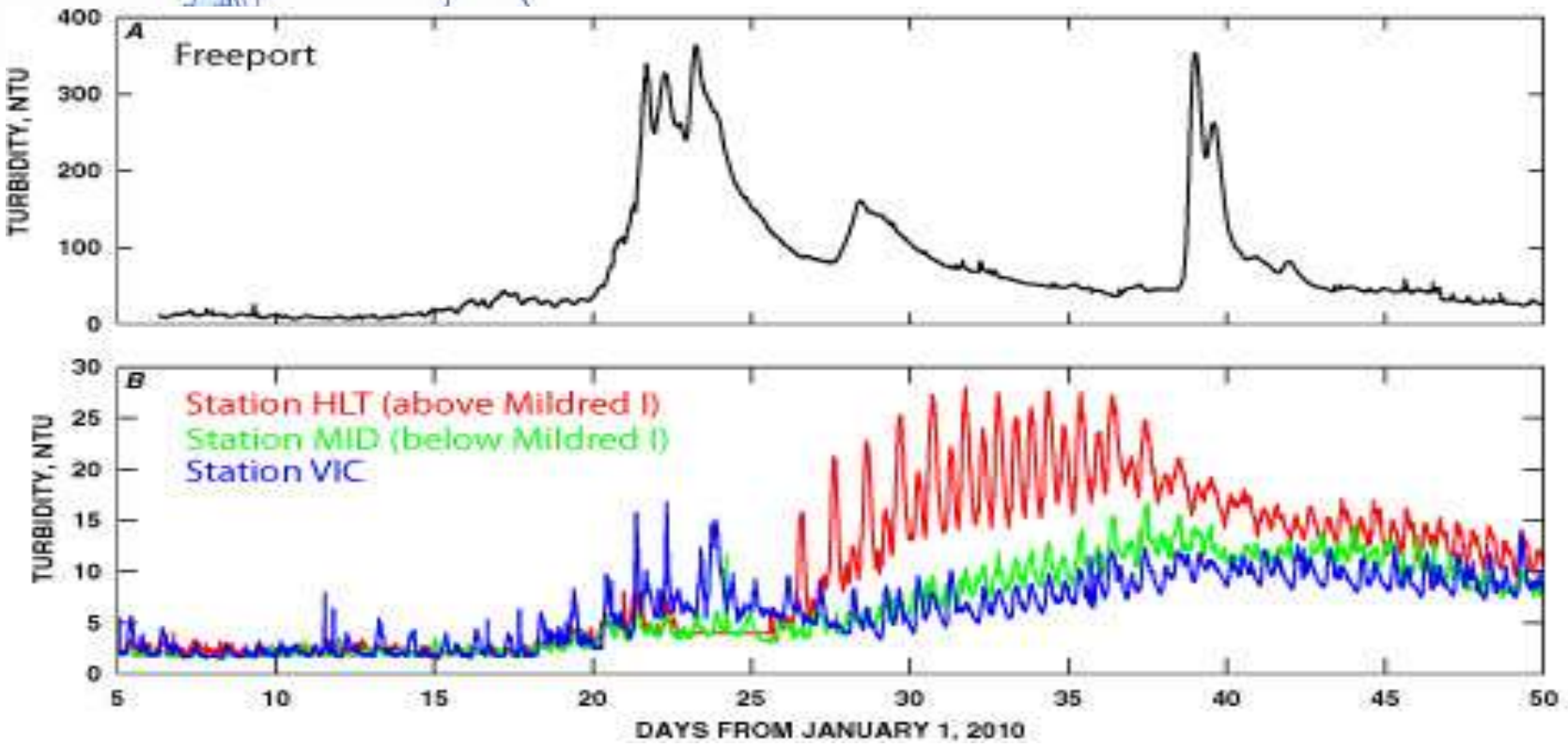
against a ….

(b) Channel with flooded island (Middle River -Mildred Island)

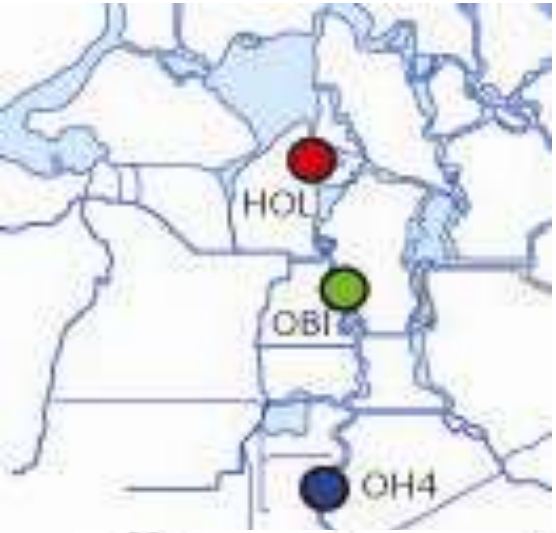
Turbidity variability - Middle River

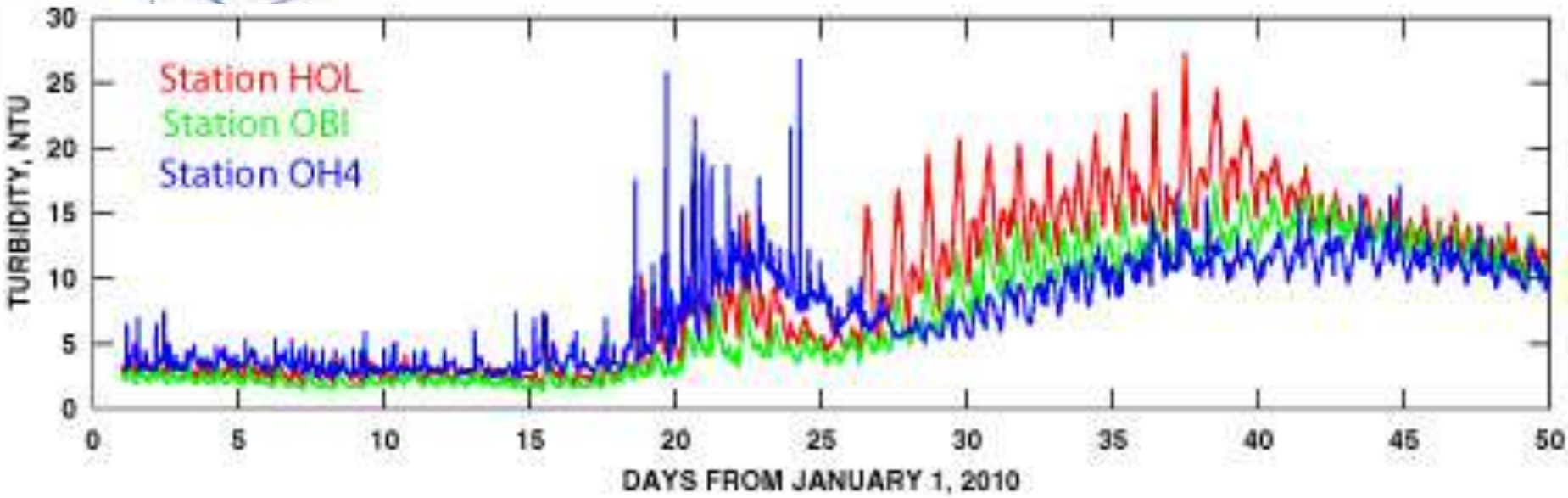


Big drop across Mildred Island



Turbidity variability - Old River





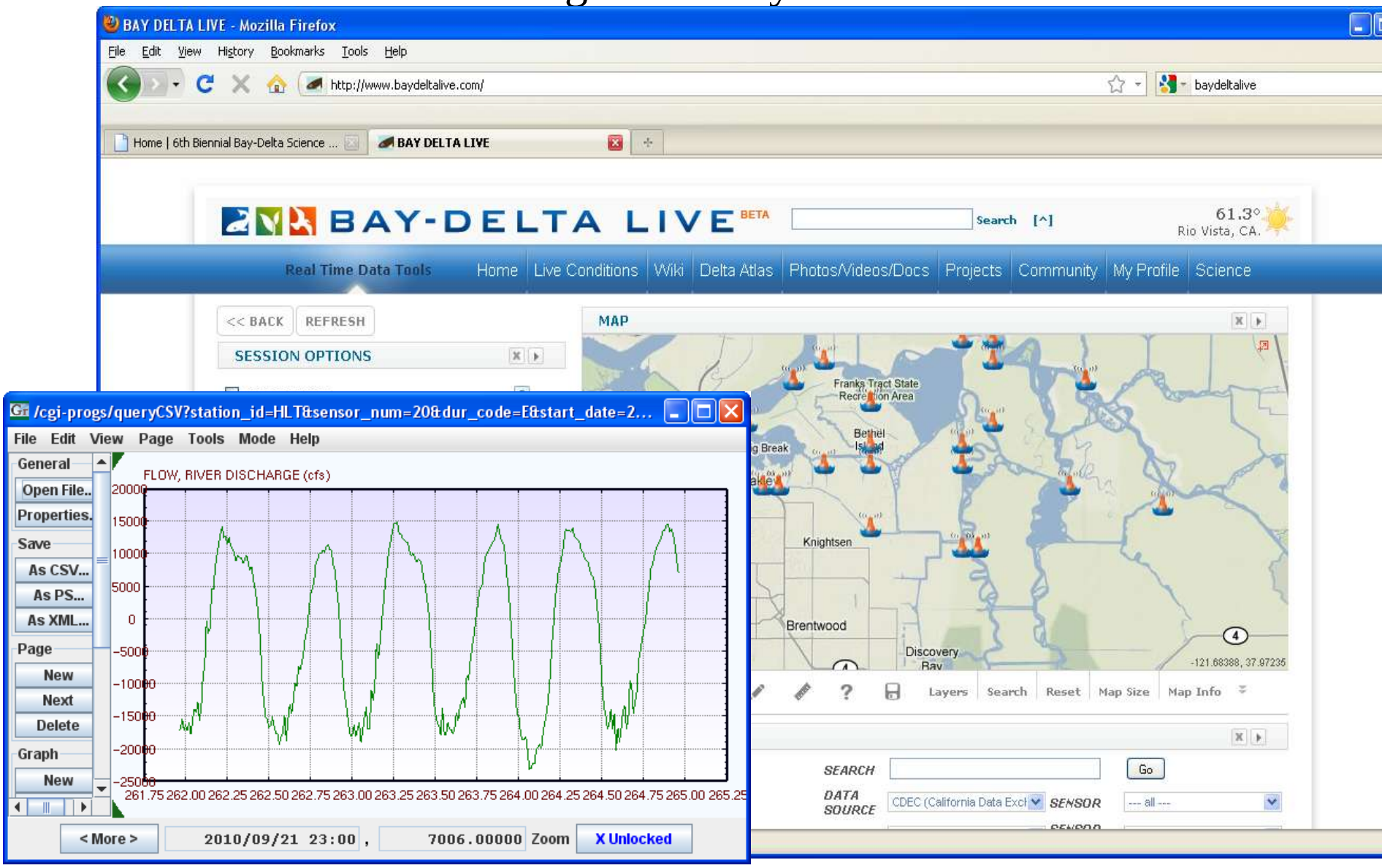
Steady decline in turbidity – no big drop

Web Based data analysis tools

USGS

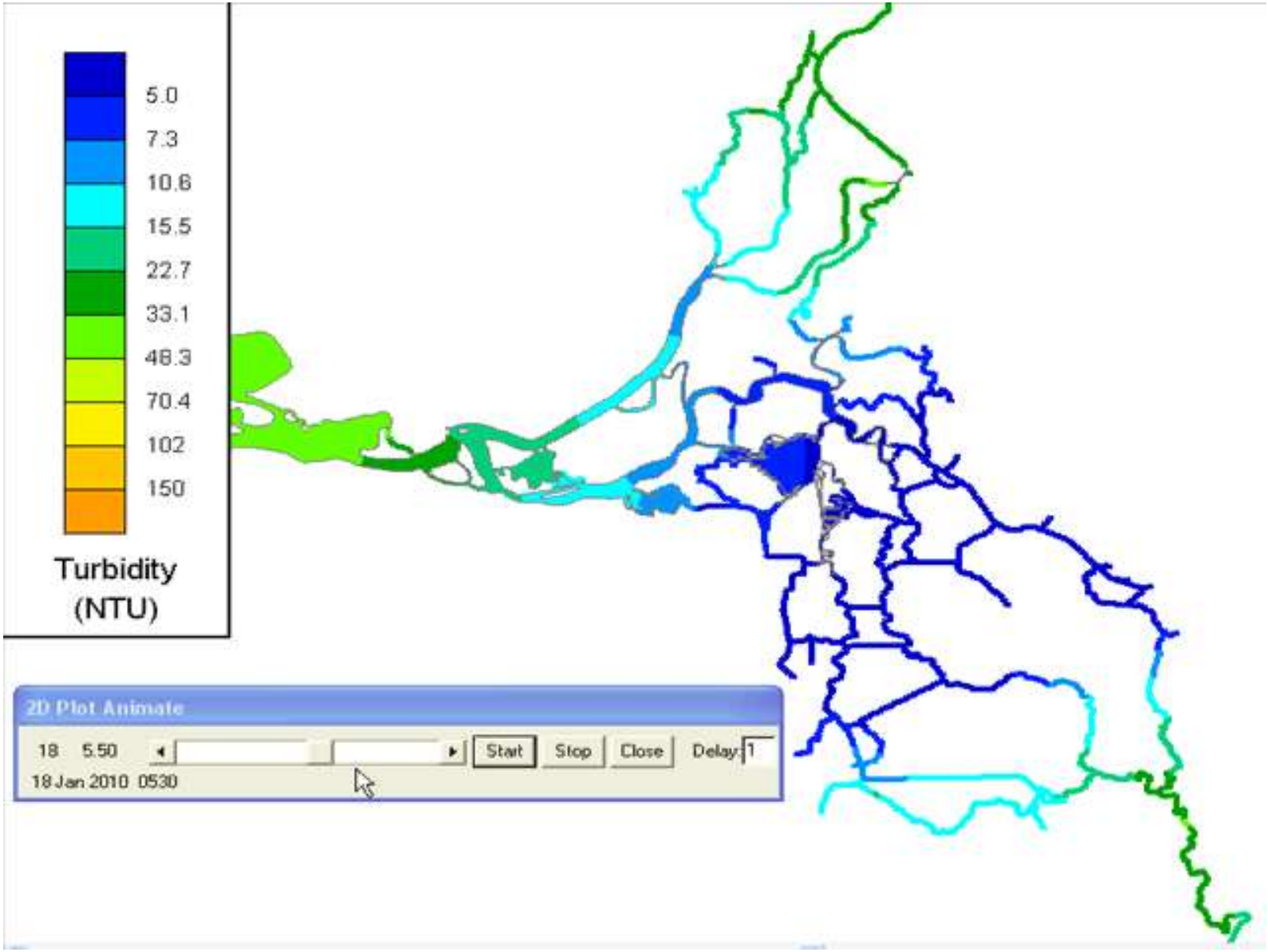
JRB

Data are available in real-time
cdec.water.ca.gov and baydelta live.com



Collaboration: John Donovan (USGS), Dave Osti (34north)

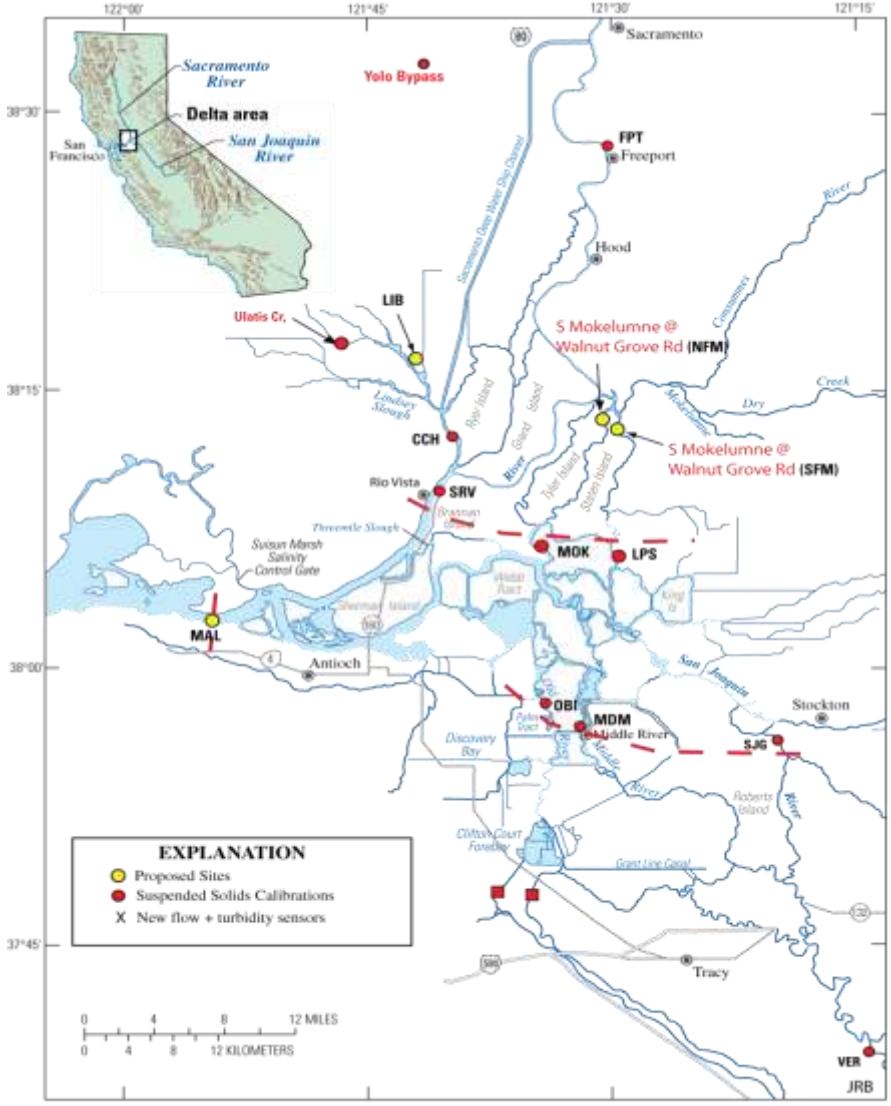
Interpolated Scalar Fields (Turbidity) Fields



Collaboration: John DeGeorge (RMA) , Dave Osti (34north)

Next Steps in the Field

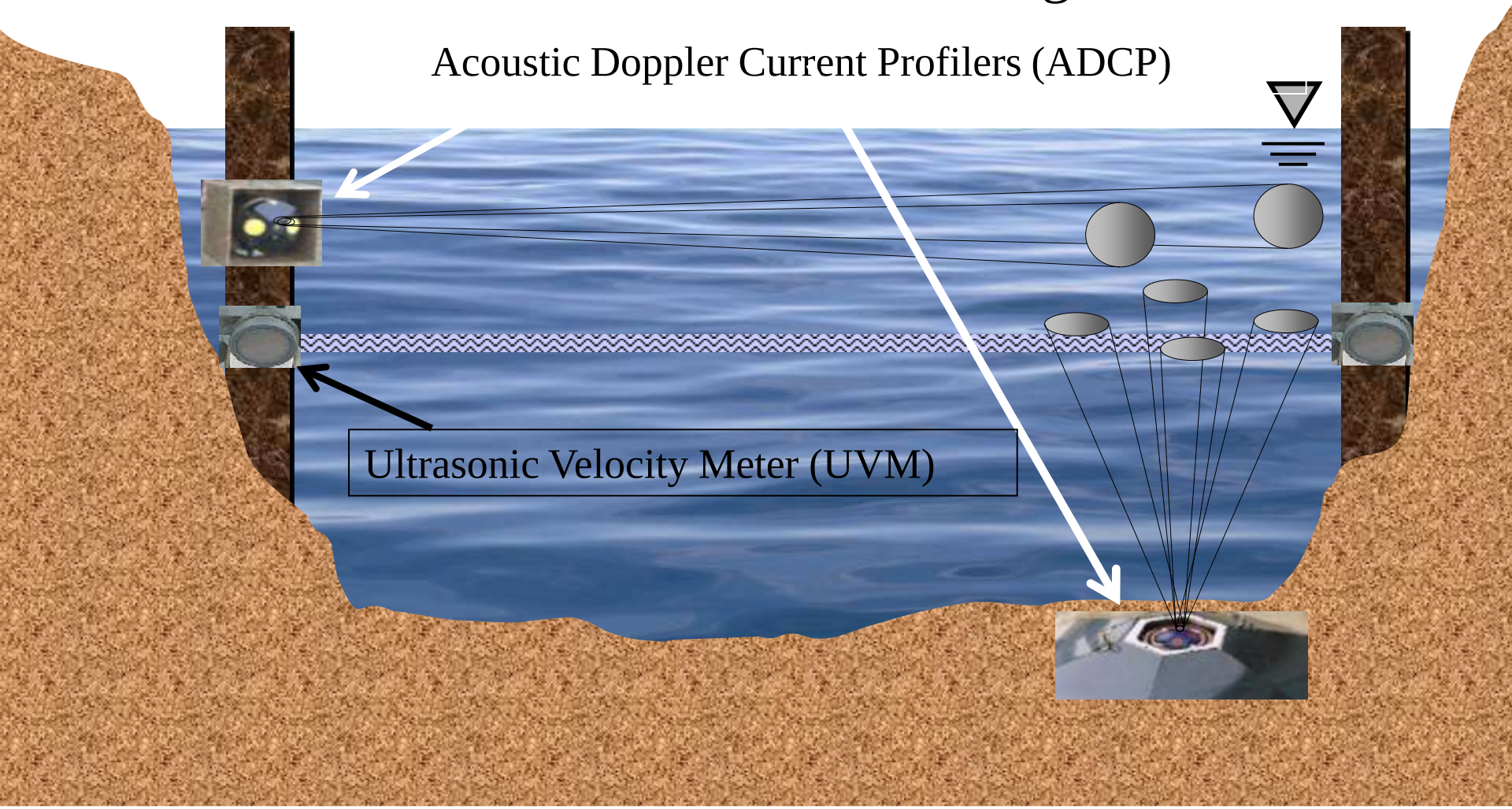
(1) Collect SSC boundary condition data



Proposed or existing locations for Suspended Solids Concentration (SSC) Calibration stations (red dot) and proposed additional flow+turbidity stations (yellow dot).

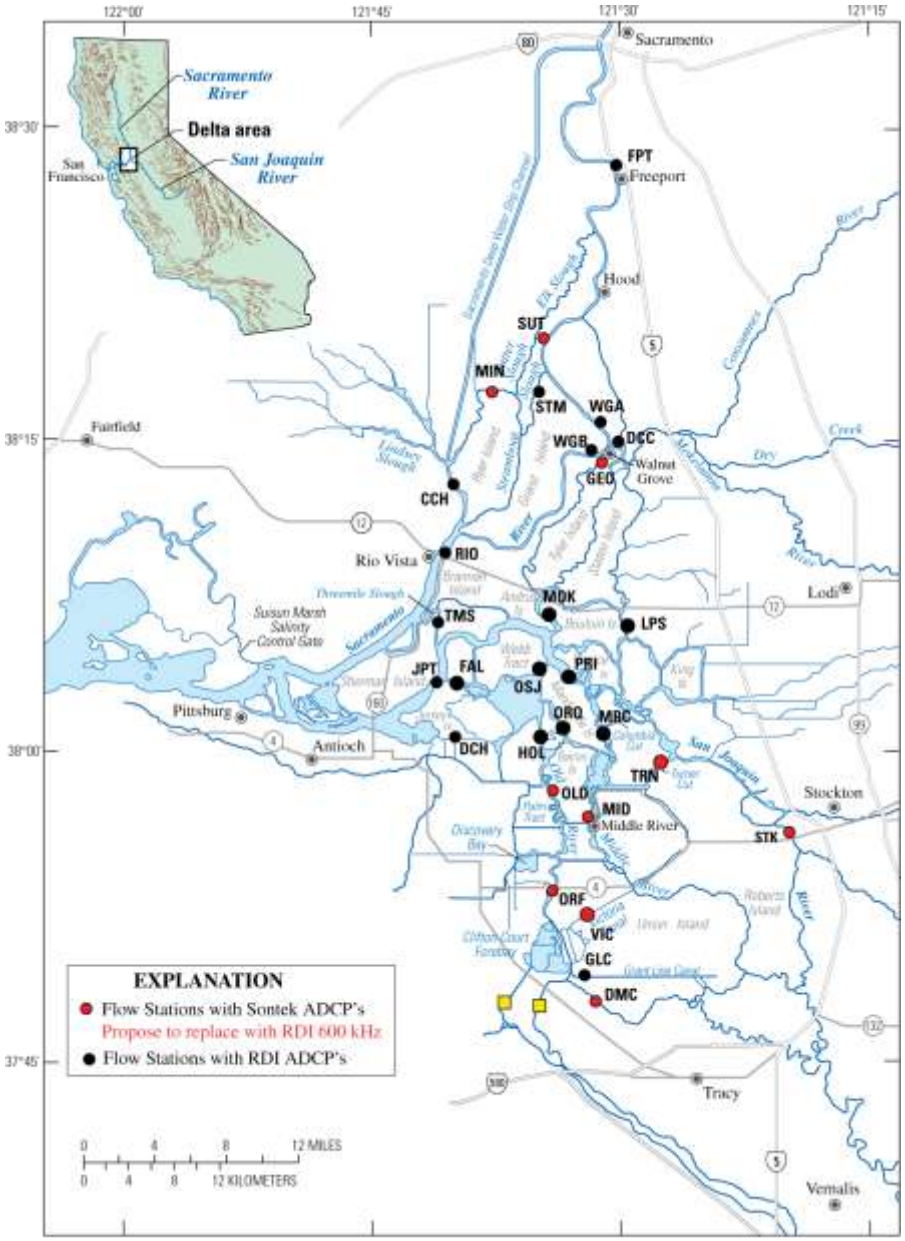
(2) Collect Acoustic Backscatter data

Flow Measurement Technologies



More reliable (less fouling), more representative

(2) Collect Acoustic Backscatter data



Location of USGS-operated flow station sites in the Delta Area of California.


Questions?